

C5571 Log Data Report

Borehole Information:

Borehole: C5571		Site: 216-A-21			
Coordinates (WA St Plane)		GWL¹ (ft): None	GWL Date: 07/31/07		
North (m)	East (m)	Drill Date	TOC Elevation	Total Depth (ft)	Type
Not available	Not available	07/07	Not available	60	Push

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Threaded Steel	1.75	6	5	1/2	1.75	60
PVC	3.9	4 1/2	4 1/4	1/8	3.9	60

Borehole Notes:

The threaded steel casing was internally contaminated. A PVC liner was introduced inside the steel casing to prevent the logging equipment from being contaminated. The PVC casing thickness was measured by the logging engineer. The steel casing dimensions were determined from the driller. Ground surface is the zero ft depth reference for data acquisition.

Logging Equipment Information:

Logging System: Gamma 1 G		Type: SGLS 35% HPGe SN: 34-TP10951A
Effective Calibration Date: 11/22/06	Calibration Reference: HGLP-CC-003	
	Logging Procedure: HGLP-MAN-002, Rev. 0	

Logging System: Gamma 1 C		Type: HRLS planar HPGe SN: 39A314
Effective Calibration Date: 11/22/06	Calibration Reference: HGLP-CC-004	
	Logging Procedure: HGLP-MAN-002, Rev. 0	

Logging System: Gamma 4 H (with AmBe source)		Type: NMLS SN: H310700352
Effective Calibration Date: 11/22/06	Calibration Reference: HGLP-CC-002	
		Logging Procedure: HGLP-MAN-002, Rev. 0

Logging System: Gamma 4 H (without AmBe source)		Type: PNLS SN: H310700352
Effective Calibration Date: 11/22/06	Calibration Reference: HGLP-CC-002	
	Logging Procedure: HGLP-MAN-002, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	5	6	7	8 Repeat	
Date	08/02/07	08/02/07	08/02/07	08/02/07	
Logging Engineer	McClellan	McClellan	McClellan	McClellan	
Start Depth (ft)	0.0	11.0	36.0	44.0	

HGLP-LDR-086

Log Run	5	6	7	8 Repeat	
Finish Depth (ft)	12.0	37.0	59.0	51.0	
Count Time (sec)	200	20	200	200	
Live/Real	R	R	R	R	
Shield (Y/N)	N	N	N	N	
MSA Interval (ft)	1.0	1.0	1.0	1.0	
ft/min	N/A	N/A	N/A	N/A	
Pre-Verification	AG131CAB	AG131CAB	AG131CAB	AG131CAB	
Start File	AG131000	AG131013	AG131040	AG131064	
Finish File	AG131012	AG131039	AG131063	AG131071	
Post-Verification	AG131CAA	AG131CAA	AG131CAA	AG131CAA	
Depth Return Error (in.)	N/A	N/A	N/A	N/A	
Comments	No fine gain adjustment	No fine gain adjustment Dead time > 40%	No fine gain adjustment	No fine gain adjustment	

High Rate Logging System (HRLS) Log Run Information:

Log Run	9	10	11	12	13 Repeat
Date	08/02/07	08/06/07	08/06/07	08/06/07	08/06/07
Logging Engineer	McClellan	McClellan	McClellan	McClellan	McClellan
Start Depth (ft)	11.0	14.0	19.0	23.0	19.0
Finish Depth (ft)	15.0	20.0	24.0	37.0	23.0
Count Time (sec)	300	300	30	300	300
Live/Real	R	R	R	R	R
Shield (Y/N)	N	N	N	N	Y (internal)
MSA Interval (ft)	1.0	1.0	1.0	1.0	1.0
ft/min	N/A	N/A	N/A	N/A	N/A
Pre-Verification	AG176CAB	AG177CAB	AG177CAB	AG177CAB	AG177CAB
Start File	AG176000	AG177000	AG177007	AG177013	AG177028
Finish File	AG176004	AG177006	AG177012	AG177027	AG177036
Post-Verification	AG176CAA	AG177CAA	AG177CAA	AG177CAA	AG177CAA
Depth Return Error (in.)	0	N/A	N/A	0	0
Comments	None	None	Dead Time > 40 %	None	Fine gain adjustment after file -028

Neutron Moisture Logging System (NMLS) Log Run Information:

Log Run	1	2 Repeat			
Date	08/01/07	08/01/07			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	0	16.0			
Finish Depth (ft)	59.25	26.0			
Count Time (sec)	15	15			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	0.25	0.25			
ft/min	N/A	N/A			
Pre-Verification	DH642CAB	DH642CAB			
Start File	DH642000	DH642238			
Finish File	DH642237	DH642278			
Post-Verification	DH642CAA	DH642CAA			
Depth Return Error (in.)	N/A	0			
Comments	None	None			

Passive Neutron Logging System (PNLS) Log Run Information:

Log Run	3	4 Repeat			
Date	08/01/07	08/01/07			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	0	14.0			
Finish Depth (ft)	59.0	23.0			
Count Time (sec)	60	15			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	1.0	0.25			
ft/min	N/A	N/A			
Pre-Verification	DH652CAB	DH652CAB			
Start File	DH652000	DH652060			
Finish File	DH652059	DH652096			
Post-Verification	DH652CAA	DH652CAA			
Depth Return Error (in.)	N/A	0			
Comments	None	None			

Logging Operation Notes:

Logging was conducted with no centralizer on the sondes. Repeat sections were acquired to evaluate system performance.

Analysis Notes:

Analyst:	Henwood	Date:	08/15/07	Reference:	GJO-HGLP 1.6.3, Rev. 0
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Pre-run and post-run verifications for the logging systems were performed before and after each day's data acquisition. The acceptance criteria were met. A combined casing correction for 0.5-in. thick steel casing and 1/8 in. thick PVC casing was applied to the spectral log data. Correction for the steel casing was derived from calibration data. A model was developed to determine the correction for the PVC casing. There is no available calibration for this casing configuration to correct moisture data to percent volumetric moisture. Therefore, the data are reported in counts per second (cps). The passive neutron data are also qualitative and are reported in cps.

SGLS and HRLS spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated with EXCEL worksheet templates identified as G1GNov06.xls and G1CNov06.xls for the SGLS and HRLS, respectively, using efficiency functions and corrections for casing, water, and dead time as determined from annual calibrations. Where dead time exceeds 40 percent, HRLS data are substituted for the SGLS data. Where the HRLS dead time exceeds 40 percent, HRLS data acquired using an internal shield are substituted.

Results and Interpretations:

Cs-137 was detected throughout this borehole at concentrations ranging from 0.3 to 1.3 million pCi/g. The maximum concentration was measured at 21 ft in depth. Because there is known to be internal contamination in this borehole, concentration measured at 1 pCi/g or less is probably not valid.

Moisture data indicate very little variation. It is not known to what degree the PVC casing that contains significant hydrogen and chlorine content affects the measurement, which normally responds to the hydrogen content in formation moisture. Additionally, the instrument is sensitive to gamma rays when the Cs-137 content exceeds approximately 100,000 pCi/g so that the count rate data could be slightly over estimated between 15 and 28 ft.

The passive neutron count rate data indicate slight elevation (i.e., 2 cps) between 15 and 28 ft. In the absence of the high gamma activity caused by Cs-137, elevated readings could indicate the existence of alpha emitting

radionuclides interacting with light elements, referred to as alpha - neutron reactions (α,n). These reactions create neutron activity that may reflect the existence of transuranic radionuclides such as Pu-239. However, in high gamma activity zones, it cannot be determined with certainty whether the elevated neutron count rate is caused by these reactions or is caused by the high gamma activity. Logging experience suggests, in this case, the apparent neutron activity is actually caused by the gamma activity.

The repeat sections generally indicate good agreement of the naturally occurring KUT, manmade radionuclides, and moisture and passive neutron count rates.

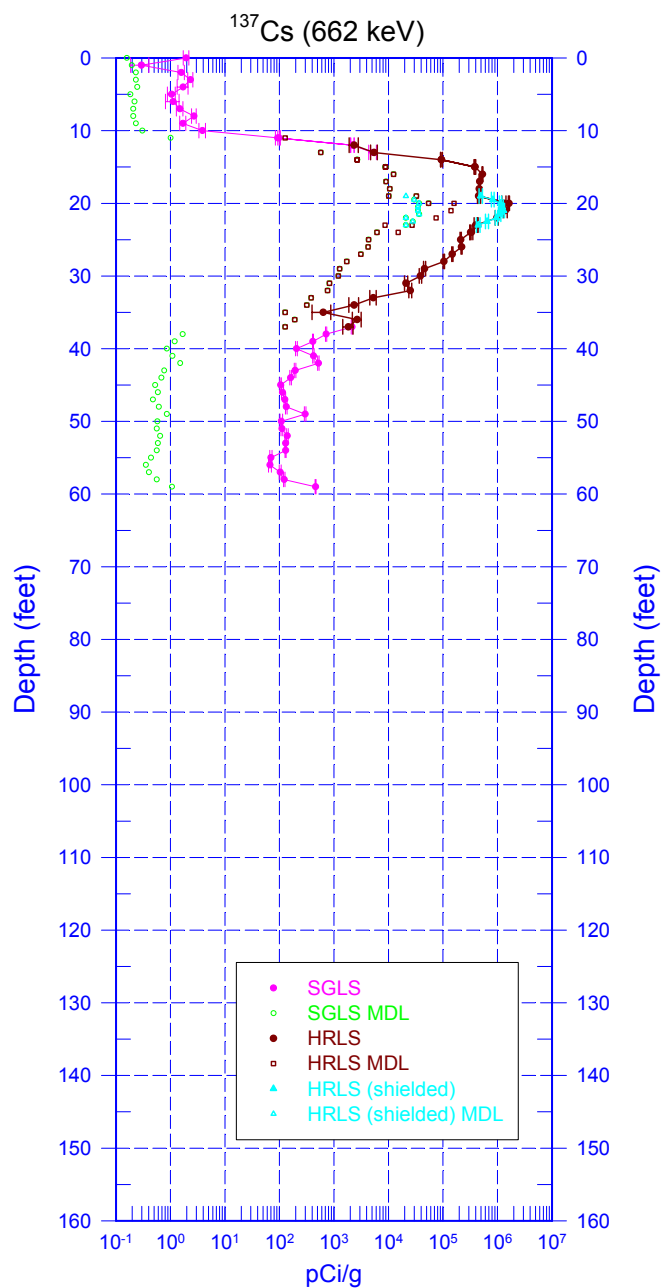
List of Log Plots:

Depth Reference is ground surface

Manmade Radionuclides
Natural Gamma Logs
Combination Plot
Total Gamma & Dead Time
Moisture & Passive Neutron
Repeat of Manmade Radionuclides
Repeat Section of Natural Gamma Logs
Repeat of Moisture & Passive Neutron

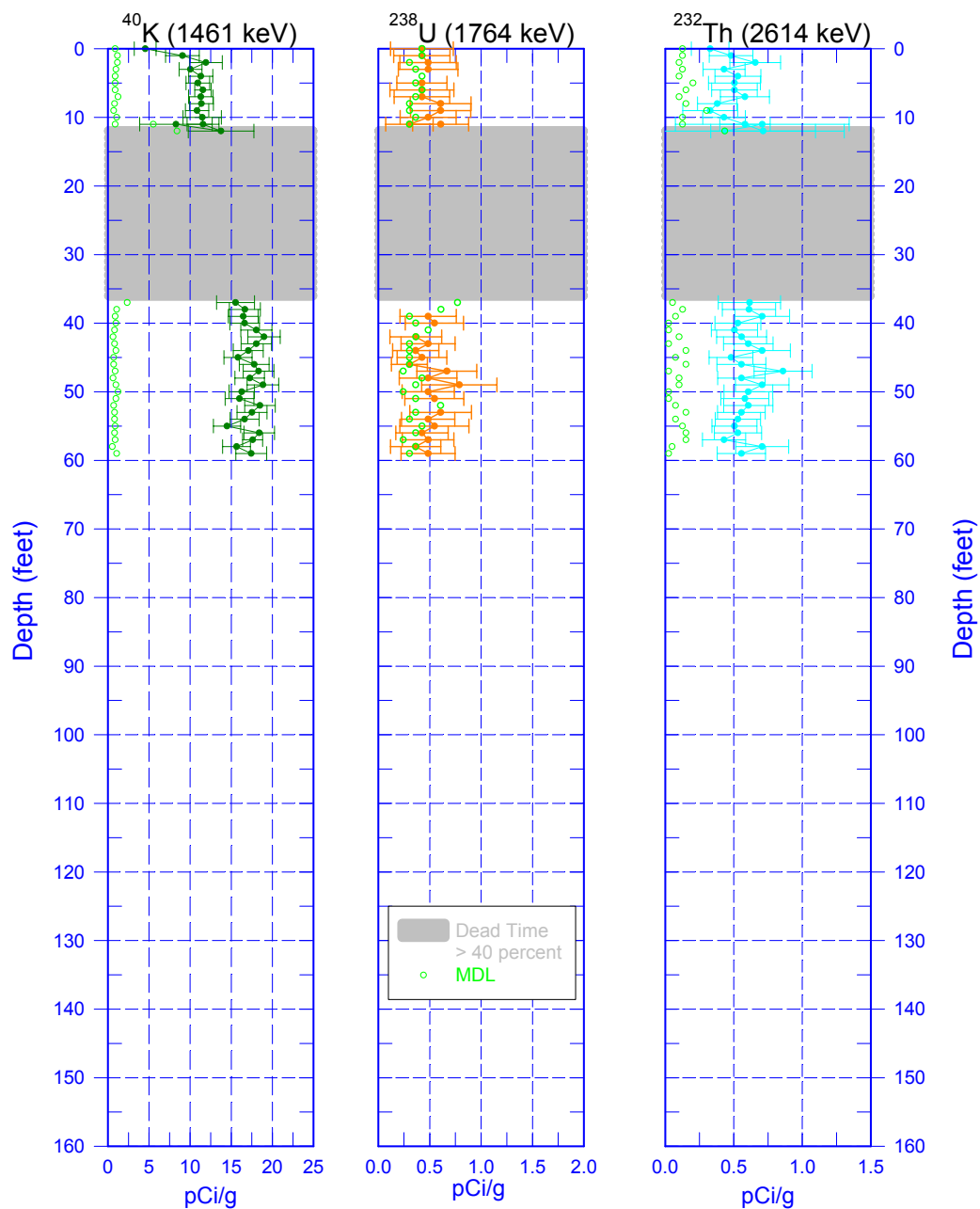
¹ GWL – groundwater level

C5571 Manmade Radionuclides



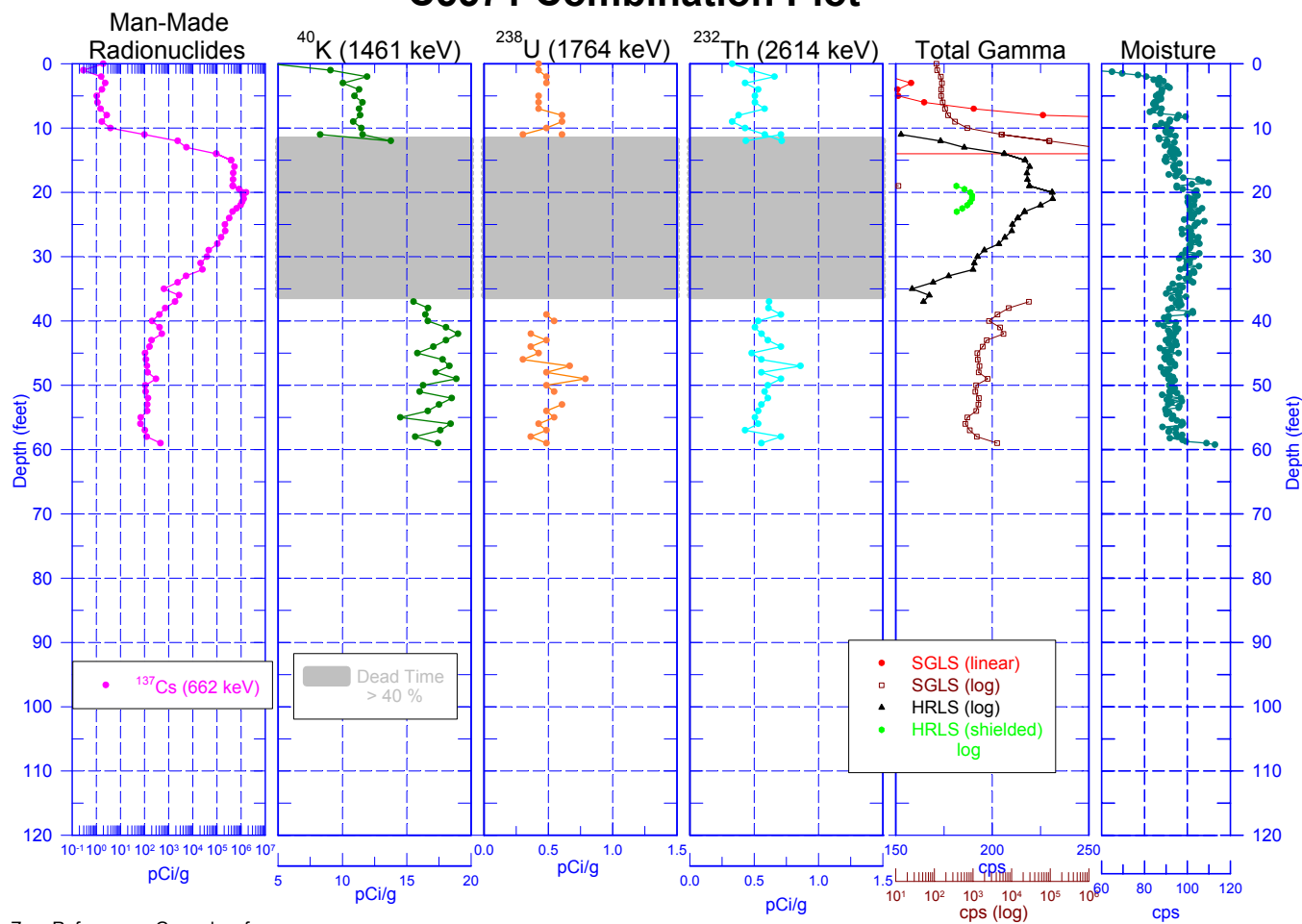
Zero Reference = Ground surface

C5571 Natural Gamma Logs

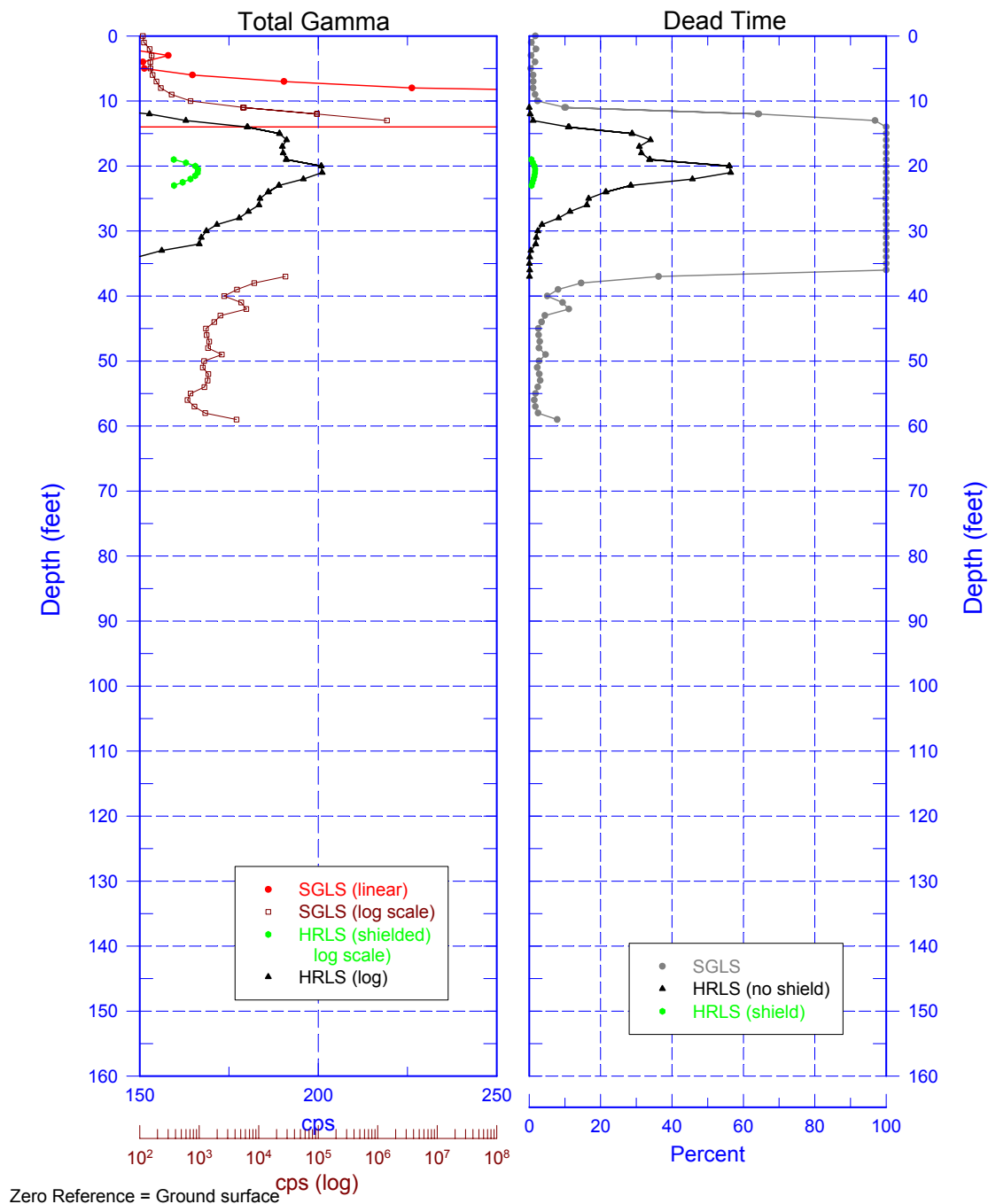


Zero Reference = Ground surface

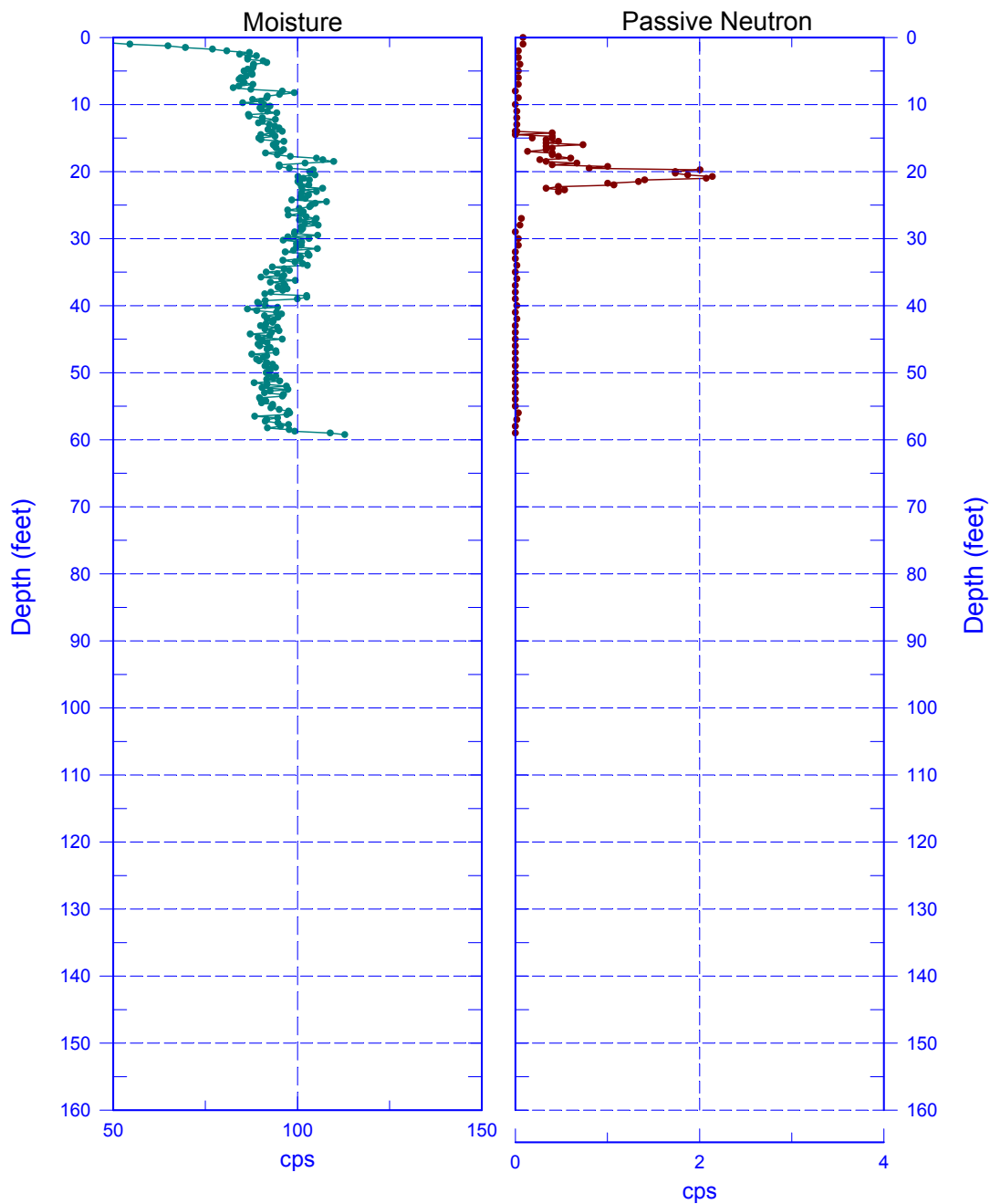
C5571 Combination Plot



C5571 Total Gamma & Dead Time

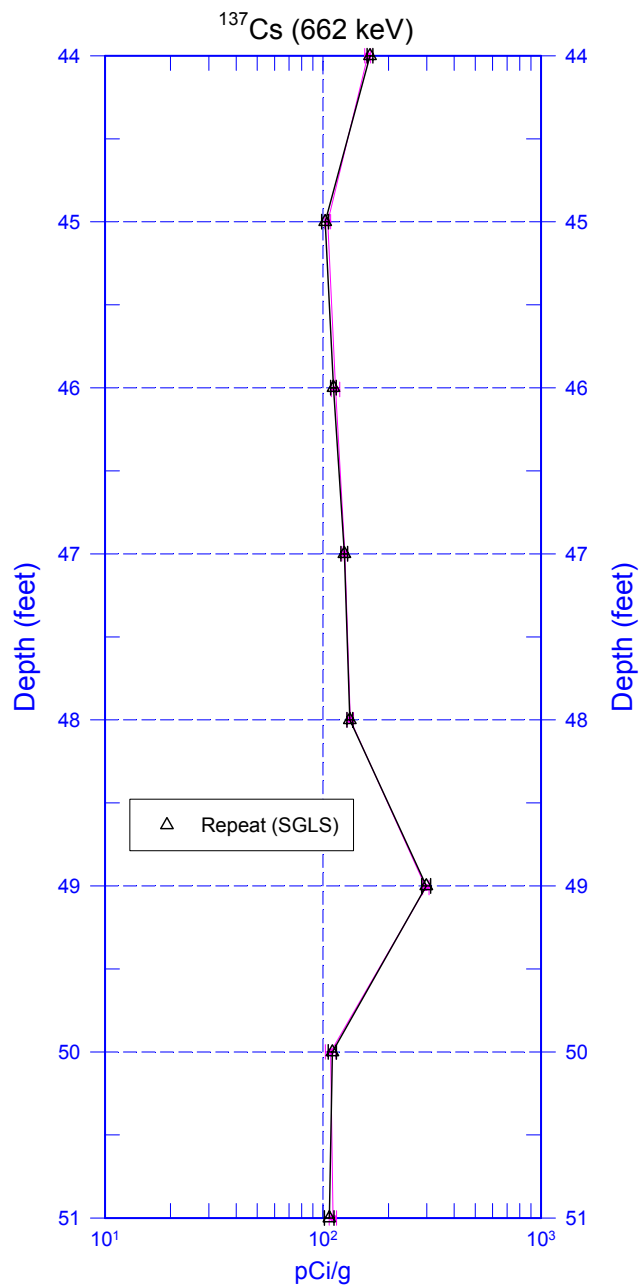


C5571 Moisture & Passive Neutron



Zero Reference = Ground surface

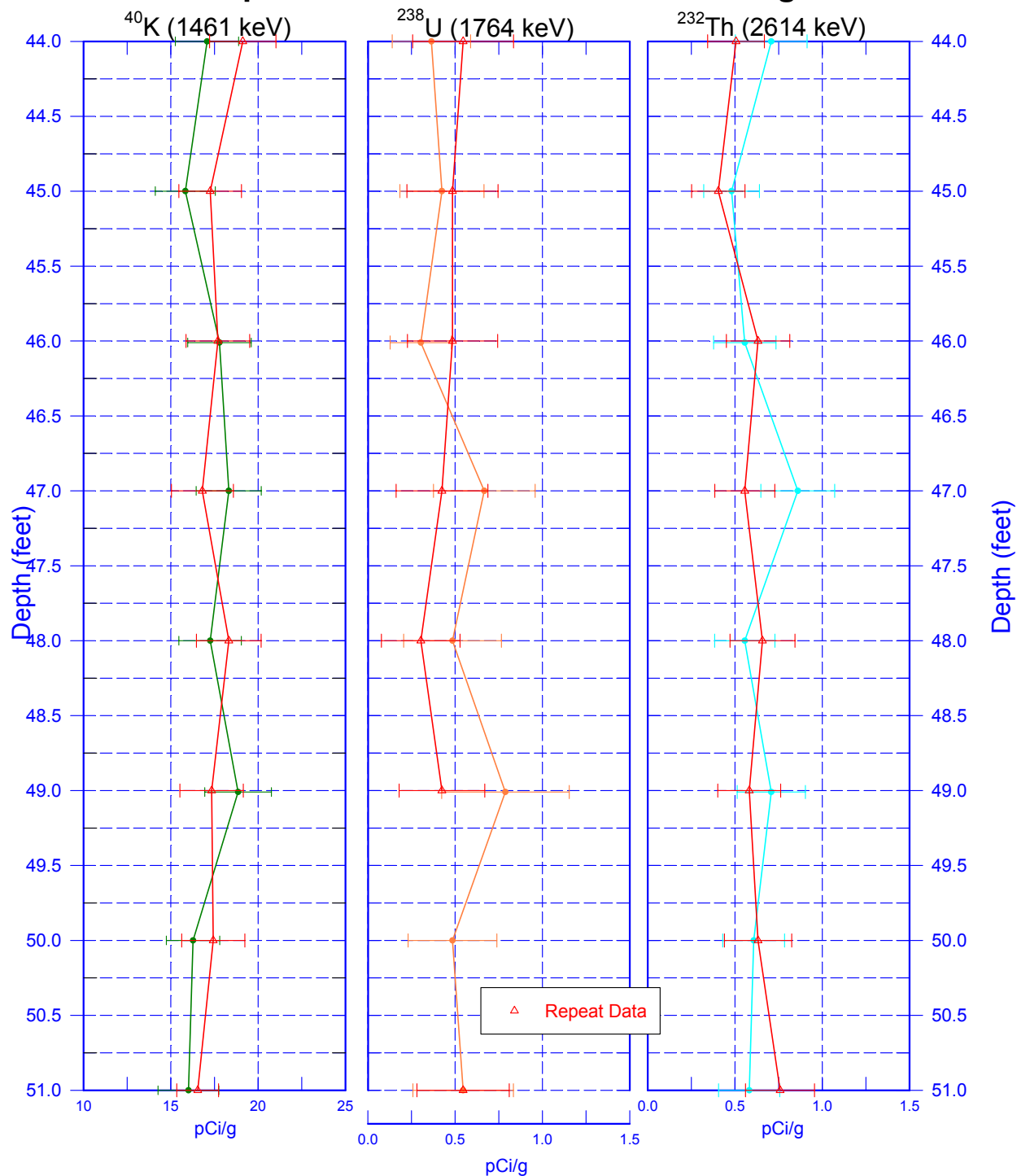
C5571 Repeat of Manmade Radionuclides



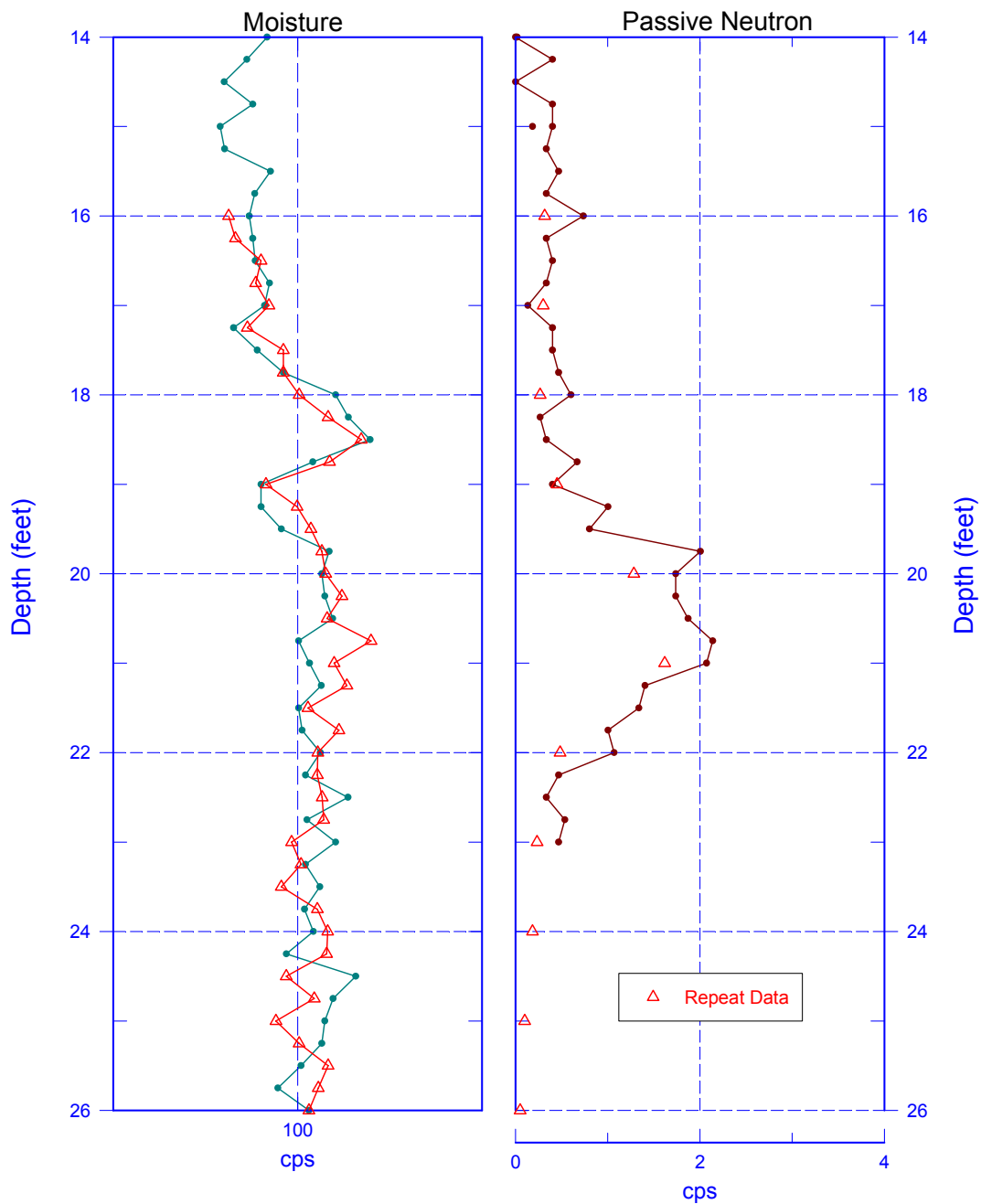
Zero Reference = Ground surface

C5571

Repeat Section of Natural Gamma Logs



C5571 Repeat of Moisture & Passive Neutron



Zero Reference = Ground surface